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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/713,671	11/13/2003	Dmitri Simonian	P121US	9864

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REFLECTIVITY, INC.
350 POTRERO AVENUE
SUNNYVALE, CA 94085

EXAMINER	
TALBOT, BRIAN K	
ART UNIT	**PAPER NUMBER**
1762	

DATE MAILED: 08/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/713,671	SIMONIAN ET AL.	
	Examiner	Art Unit	
	Brian K. Talbot	1762	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *6/2/06 (RCE)*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6,8-39,43-64 and 84-89* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,8-39,43-64 and 84-89* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 6/2/06 has been entered.

2. Claims 7 and 65-83 have been canceled. Claims 85-89 have been added. Claims 1-6, 8-39,43-64 and 84-89 remain in the application.

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. In light of the amendment filed 6/2/06, the references Hornbeck (5,411,769) and Zazerra et al. (6,537,380) have been withdrawn in the rejections.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim Rejections - 35 USC § 103

6. Claims 1-6,8-18,20,23-30 and 84-89 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ashurst et al., Wafer level anti-stiction coating for MEMS" in combination with Chinn et al. (6,830,950) or Hankins et al. (7,045,170).

Ashurst et al., Wafer level anti-stiction coating for MEMS" teaches applying dichlorodimethylsilane (DDMS) anti-stiction coating on MEMS devices (abstract). Silicon samples are rinsed in acetone and cleaned with UV and ozone (UVO), treated with HF and UVO cleaned again prior to depositing the DDMS coating thereon. The pressure is reduced to less than 10 mTorr for plasma UVO cleaning. Water gas is also utilized during the cleaning process. Next the chamber pressure raised and DDMS is introduced to form the anti-stiction layer (pgs. 8-9). Hydrogen peroxide is also taught as a known cleaning agent for silicon surface prior to forming anti-stiction coatings (pg. 4)

Ashurst et al., Wafer level anti-stiction coating for MEMS" fails to teach cleaning the MEMS with ozone without the use of UV.

Chinn et al. (6,830,950) teaches pre-treating surfaces of MEMS structure with a plasma generated source gas comprising oxygen and optionally hydrogen (abstract). The cleaning chamber is at a temperature of from 20-80°C. The processing conditions set forth above are for

use with the plasma processing system shown in schematic in FIG. 3; however, one skilled in the art may use any suitable plasma processing system available in the industry, with appropriate adjustments to the processing conditions.

Hankins et al. (7,045,170) Accordingly, the silicon surface of the MEMS device 310 can be cleaned prior to deposition of the anti-stiction coating. A variety of methods can be used to clean the surface, depending on the residual or surface termination left by the fabrication of the MEMS device 310. These cleaning methods include heating the MEMS device 310 at ambient pressure to a temperature greater than 100°C in an inert environment, heating the MEMS device 310 at sub-ambient pressure and less than 100°C in an inert environment, placing the MEMS device 310 in a dry environment for a period of time, cleaning surface residuals with a vapor-phase ozone system, and cleaning the surface with an oxidizing plasma.

Therefore it would have been obvious for one skilled in the art at the time the invention was made to have modified Ashurst et al., Wafer level anti-stiction coating for MEMS" pre-treating process by treating the MEMS device with ozone absent UV assistance and a the claimed temperatures with the expectation of achieving a cleaned surface for subsequent anti-stiction deposition as evidenced by Chinn et al. (6,830,950) or Hankins et al. (7,045,170).

Claims 26 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ashurst et al., Wafer level anti-stiction coating for MEMS" in combination with Chinn et al. (6,830,950) or Hankins et al. (7,045,170) further in combination with Wallace et al. (5,512,374).

Ashurst et al., Wafer level anti-stiction coating for MEMS" in combination with Chinn et al. (6,830,950) or Hankins et al. (7,045,170) fail to teach the anti-stiction coating being perfluoropolyether.

Wallace et al. (5,512,374) teaches perfluoropolyether coating for eliminating sticking and adhesion in MEMS devices (abstract).

Therefore it would have been obvious for one skilled in the art at the time the invention was made to have modified Ashurst et al., Wafer level anti-stiction coating for MEMS" in combination with Chinn et al. (6,830,950) or Hankins et al. (7,045,170) process by substituting on anti-stiction agent (DDMS) for another (PPFE) with the expectation of achieving similar success as evidenced by Wallace et al. (5,512,374).

Claims 31-39 and 43-64 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ashurst et al., Wafer level anti-stiction coating for MEMS" in combination with Chinn et al. (6,830,950) or Hankins et al. (7,045,170) further in combination with Malone (6,951,769).

Ashurst et al., Wafer level anti-stiction coating for MEMS" in combination with Chinn et al. (6,830,950) or Hankins et al. (7,045,170) fail to teach the MEMS device being placed in an assembly and then into the chamber for cleaning/coating.

Malone (6,951,769) teaches mounting MEMS devices on an assembly substrate and coupling an assembly lid to the assembly substrate and over the MEMS devices to create an interior of the MEMS device. The MEMS device can be contacted through an opening (abstract and Figs.).

Therefore it would have been obvious for one skilled in the art at the time the invention was made to have modified Ashurst et al., Wafer level anti-stiction coating for MEMS" in combination with Chinn et al. (6,830,950) or Hankins et al. (7,045,170) chamber to have placed the MEMS device in assembly for cleaning/coating as evidenced by Malone (6,951,769) with the expectation of achieving similar results

Response to Amendment

7. Applicant's arguments with respect to claims 1-6,8-39,43-64 and 84-89 have been considered but are not found to be persuasive.

Applicant argued that the prior art fails to teach the temperature of the cleaning chamber being from 100-200°C.

Chinn et al. (6,830,950) or Hankins et al. (7,045,170) both teach the claimed cleaning chamber temperature as noted above. In addition, it is noted that Applicant argued that Chinn et al. (6,830,950) teaches a temperature with an upper limit of 80°C. It has been well settled that without the showing of criticality concerning a "result effective variable", the mere optimization of the variable would be within the skill of one practicing in the art especially since the processes are substantially identical or equivalent in terms of function, manner and result. This is the case her as both processes are directed toward cleaning MEMS devices with ozone/plasma prior to form an anti-stiction coating thereon.

Applicant argued that the assembly of Malone is different from the assembly now claimed.

The Examiner disagrees as detailed above in the rejection. The Examiner acknowledges the fact that the opening of Malone is not recited to be of the claimed dimension around 10 micrometers or less. However, Malone is concerned with flowing a gaseous material to the MEMS device and it is the Examiner's position that the opening would be within the claimed range as one skilled in the art would recognize that when utilizing gaseous material the opening would not have to be very large to allow passage of the gaseous material to the inside of the chamber. Furthermore, it would have been obvious to one having ordinary skill in the art to have determined the optimum values of the relevant process parameters (such as in this case the size of the opening) through routine experimentation in the absence of a showing of criticality. *In re Aller*, USPQ 233 (CCPA 1955).

Applicant argued that newly submitted claims 85-89 recite two cleaning steps with separate pressures without UV and the prior art teaches a two cleaning steps performed at the same pressure.

The Examiner agrees in part. It has been well settled that the transposition of process steps or the splitting of one step into two, where the processes are substantially identical or equivalent in terms of function, manner and result, was held to be not patentably distinguish the processes. *Ex parte Rubin,* 128 USPQ 440 (Bd. Pat. App. 1959)

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian K. Talbot whose telephone number is (571) 272-1428. The examiner can normally be reached on Monday-Friday 6AM-3PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy H. Meeks can be reached on (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

B K Talbot 8/9/06

Brian K Talbot
Primary Examiner
Art Unit 1762

BKT